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Journal of the Society of Arts.

FRIDAY, OCTOBER 26, 1855.

GENERAL MEETING.

FRIDAY, OCTOBER 19, 1855.

A General Meeting of the members, specially convened for the purpose of altering and revoking the existing Bye-laws, and making others in their place, was held on Friday, the 19th instant, the Rev. Dr. Booth, F.R.S., Chairman of Council, in the chair.

The Secretary read the Bye-laws under the authority of which the meeting was convened, the notice convening the meeting, together with a copy of the motion intended to be brought forward at this meeting, which had been duly suspended in the Society's rooms during the seven days previous, and also the notice of the meeting, which had been twice duly advertised in the *Times* and *Daily News* newspapers.

The following motion, of which notice had been duly given, was proposed by Mr. Joseph Glynn, F.R.S., and seconded by Mr. G. F. Wilson, F.R.S., and carried unanimously:—

“That the existing Bye-laws be revoked, and that in the place thereof the following be the Bye-laws of this Society.”

BYE-LAWS.

I. THE PRESIDENT.

1. The President shall be elected annually.

II. THE VICE-PRESIDENTS.

2. The number of Vice-Presidents shall not exceed twenty, and they shall be elected annually.

III. THE TREASURERS.

3. The Treasurers shall be elected annually.
4. They shall have the custody of the Common Seal.
5. All moneys except investments, and except a sum not exceeding thirty pounds, shall be kept at the bankers of the Society, in the joint names of the two Treasurers, who shall thereout, by cheques on such bankers, signed by either of them, and countersigned by the Secretary, discharge such liabilities of the Society as shall severally exceed five pounds.
6. No cheques shall be drawn without a previous vote of the Council.
7. All receipts shall be signed by one of the Treasurers.

IV. THE COUNCIL.

8. The Council shall consist of the President, the Vice-Presidents, the Treasurers, and twelve other members of the Society.
9. It shall, at its first meeting elect, by ballot, a Chairman. The Chairman of the preceding year shall not be re-elected to that office.
10. The Chairman of the Council shall deliver an address to the Society at its first ordinary meeting after his election, declaratory of the policy which the Council propose to follow during its year of office.
11. The Council shall nominate all Committees.
12. The Chairman shall be *ex officio* a member of all committees.
13. It shall be the duty of the Council to prepare the balloting-list in the manner hereinafter provided and directed by the bye-laws.

14. A Special Meeting of the Council shall be called by the Secretary on the requisition of the Chairman, of a Treasurer, or of any three members thereof.

15. At all meetings of the Council three shall be a quorum, except when otherwise directed by these bye-laws.

16. The Common Seal of the Society shall not be affixed to any deed or instrument except on the authority of a previous order or resolution of the Council, and in the presence of the Chairman or one of the Treasurers, and of the Secretary.

17. No order or resolution for affixing the Common Seal to any deed or instrument shall be valid unless made or passed at a meeting of the Council specially summoned for the purpose, at which not less than six members of the Council shall be present.

18. The Council shall have power to suspend the Secretary or Collector and Financial officer from his duties.

19. The Secretary or Collector and Financial officer shall be dismissed only by a vote of a General Meeting on the report of the Council, which shall alone be competent to convene such meeting.

20. The Assistant Secretary shall be appointed by the Council.

V. THE AUDITORS.

21. There shall be two Auditors of Accounts.
22. The Auditors shall examine the accounts of the Society, and call for such vouchers and receipts or other information with respect to them as they may think fit, and shall examine the Annual Statement of Receipts, Payments, and Expenditure, and of Assets and Liabilities, and report thereon to the Annual General Meeting.
23. The Auditors may attend the meetings of the Council.

VI. THE SECRETARY.

24. There shall be a paid Secretary elected annually, and an Assistant Secretary if necessary, who shall not be members of the Society.
25. The Secretary, or the Assistant Secretary if required, shall attend all meetings of the Society, the Council, and the Committees; and discharge all duties which usually appertain to the office of Secretary.
26. The Secretary shall issue all the notices of meetings, and shall prepare, under the direction of the Council, an Annual Report of the state of the Society.
27. He shall also have the charge of the house, furniture, library, pictures, papers, models, and other effects belonging to the Society, and be bound to keep a correct inventory thereof.
28. He shall lay before the Council all communications addressed to the Society, and under the direction of the Council shall conduct the correspondence and business of the Society. He shall *ex officio* be the responsible Editor of the Society's Journal, and shall superintend through the press all papers printed by order of the Council.

VII. THE COLLECTOR AND FINANCIAL OFFICER.

29. There shall be a Collector and Financial Officer, elected annually, who shall not be a member of the Society.
30. He shall give security to the satisfaction of the Council, for the faithful discharge of his duties.
31. He shall collect the subscriptions and other monies from the members as they become due, and shall pay the same into the Society's bankers whenever they shall amount to thirty pounds, and report such payments to the next meeting of the Council.
32. He shall attend at all meetings of the Society, and shall superintend the ballot for members.
33. He shall attend the meetings of the Council when required.
34. He shall from time to time prepare lists of those members whose subscriptions are in arrear, and report the same to the Treasurers.

35. He shall, under the direction of the Treasurers, keep the accounts of the Society.

VIII. COMMITTEES.

36. The Council shall proceed, as soon as convenient after the Annual General Meeting, to form lists of those who may be considered specially eligible to serve with others on such Committees of reference as may be appointed from time to time. To these committees the Council may refer for examination, advice, and report, such discoveries, inventions, improvements, and novelties, in Arts, Manufactures, and Commerce, and other matters, as shall from time to time be brought under its notice. The names of the members so selected to serve on the several Committees of reference shall be published in the *Journal* of the Society, and due notification of the Council's desire to obtain their co-operation and advice shall be given to each member.

37. The Council shall from time to time nominate such other Committees as may be necessary.

38. No act, order, or resolution of any Committee shall bind the Society, unless it be done or made by the direction and authority of the Council, or be ratified by them.

39. It shall be competent for the Council to invite the co-operation of persons not members of the Society, but who are eminent in Arts, Manufactures, and Commerce, and in the applications of science to their development, and to associate such persons with the Committees of reference.

IX. THE ANNUAL GENERAL MEETING.

40. There shall in every year be held one General Meeting of the Society, to be called the Annual General Meeting.

41. This Meeting shall be held on the last Wednesday in June of each year, and the chair shall be taken at four o'clock in the afternoon.

42. At this Meeting the Council shall render to the Society a full account of all their proceedings, and a statement of the funds of the Society, and of the Receipts, Payments, and Expenditure during the past year, and a copy of such statement shall be published in the *Journal* of the Society on the Friday before such General Meeting.

43. At this Meeting, the President, the Vice-Presidents, the Treasurers, with the other Members of the Council, the Auditors, the Secretary, and the Financial Officer, shall be elected in the manner and form laid down in Sec. XIV.

44. At this Meeting there shall be no election of members or any other business whatever transacted, other than that specially appointed by these bye-laws, unless notice thereof in writing, containing a clear statement of the business to be proposed, and signed by two members, shall be delivered to the Secretary two days before such Meeting.

45. Notice of the holding of the Annual General Meeting, shall be given in the Society's *Journal*, and in one of the London morning papers.

46. The Council shall have power to hold the Annual General Meeting on the next or next but one following Wednesday at the same hour, should they consider it necessary so to do. But in such case, they shall give seven clear days' notice of such Annual Meeting, twice in two of the London morning papers of general circulation, and also in the Society's *Journal*.

47. None but members, officers of the Society, or persons specially invited by the Council, shall be permitted to be present at the Annual General Meeting.

48. At this Meeting the chair shall be taken by the President, the Chairman of Council, or one of the Vice-Presidents.

X. GENERAL MEETINGS.

49. At General Meetings the chair shall be taken by the President, or in his absence by one of the Vice-Presidents, or by the Chairman of the Council, or in their absence by some member to be chosen by the meeting.

50. The Council may convene a General Meeting for any special purpose whenever they think necessary.

51. The Council shall convene a General Meeting, for a special purpose, upon a requisition to that effect signed by not less than twelve members of the Society.

52. Notice of every General Meeting for a special purpose, and of the purpose for which it is convened, shall be hung up in the Society's room seven days previous to the holding thereof, and advertised during that interval in the Society's *Journal*, or elsewhere.

53. No business shall be transacted at a General Meeting for a special purpose other than that for which it shall have been convened.

54. No Member whose subscription is in arrear shall be entitled to be present, debate, or vote at any General Meeting.

55. Motions made at General Meetings of the Society shall be in writing, and signed by the mover and seconder.

XI. OF THE SESSION AND THE ORDINARY MEETINGS.

56. The Session shall commence on the third Wednesday in November, and shall end on the last Wednesday in June.

57. There shall be Ordinary Meetings of the Society on every Wednesday evening at eight o'clock during the Session, unless otherwise directed by the Council.

58. At each of the Ordinary Meetings, a paper or papers on some one or more subject or subjects relating to inventions, improvements, discoveries, and other matters connected with Arts, Manufactures, or Commerce, or the encouragement thereof, shall be read and discussed.

59. No decision on the merits of the papers so read shall be taken at the meeting.

60. No business of any kind, other than the foregoing, shall be transacted at such Ordinary Meetings, except the proposition of candidates and the election of members.

61. No paper shall be read at an Ordinary Meeting of the Society unless it shall have been approved of by the Council, but this approval shall not be taken as expressing an opinion upon the statements made or the arguments used in such paper.

XII. OF THE ADMISSION OF MEMBERS, &c.

62. Candidates for admission as Members must be proposed and recommended by not less than three Members of the Society, according to the form following:—

"We hereby propose and recommend" [*here state Christian name, rank, profession or business, and usual place of residence of the Candidate*] "as a fit and proper person to become a Member of the Society for the Encouragement of Arts, Manufactures, and Commerce." [*Here must follow the signatures of three Members of the Society, one of whom must have personal knowledge of the Candidate.*]

The paper thus signed shall be read at an Ordinary Meeting of the Society, and afterwards hung up in the Society's room until the second following Ordinary Meeting, when the Candidate shall be balloted for; and if three-fourths of the Members then balloting shall vote in his favour, he shall be declared elected a Member.

63. Every person so elected, on paying his first annual subscription, shall thereby become a Member of the Society, and his name shall be inscribed in the register of Members.

64. No person shall be entitled to any of the privileges of a Member, until he shall have paid his annual subscription, or such other sum as is specified by these bye-laws as a composition in lieu of annual subscriptions, and shall have signed the following Form:—

"I, the undersigned, having been elected a Member of the Society for the Encouragement of Arts, Manufactures, and Commerce, do hereby promise that I will submit and conform in all respects, and be governed by the terms and provisions of the Charter and the Bye-laws made in pursuance thereof; provided that whenever I signify in writing to the

Secretary that I am desirous of ceasing to be a Member thereof, I shall be free from this obligation, after payment of any Annual Subscription or arrears which may be due from me at that period."

65. The annual subscription of every Member shall be Two Guineas at least.

66. Every Member elected previous to the 15th day of March, 1848, shall continue to be liable to pay the same subscription or other sum that he would have been liable to pay under the previous rules and regulations of the Society, if the same had not been repealed.

67. The annual subscription becomes due in advance, and is payable for each year at its commencement, such commencement to be reckoned from the quarter-day next preceding the day of election.

68. Any Member may commute or compound for all future payments, and become a member for life, by payment of a sum of not less than Twenty Guineas.

69. Ladies may be elected Members.

70. The Council shall have power in each year to admit five persons eminent in Arts, Manufactures or Commerce, or in the application of abstract Science to the same, as Life Members of the Society, without the ordinary formalities of election, and without payment of any subscription whatever.

71. Foreigners and persons not residing in Great Britain or Ireland, duly proposed and elected, may become Corresponding Members, without payment of any subscription, and may attend, but not vote at General or Ordinary Meetings.

72. Due notice of their election shall be sent immediately to the newly-elected Members, together with the Form of assent (64) for signature.

73. Every Member shall continue such, and be liable to pay his subscription, until he shall have complied with the following bye-law.

74. Any Member desirous of withdrawing from the Society must give notice in writing of his desire to that effect to the Secretary, and on payment of all subscriptions and arrears which may be due from him up to that period, he shall thenceforth cease to be a member of the Society.

75. If the annual subscription of any Member residing in the United Kingdom shall be in arrear for three years, the Collector and Financial officer shall give notice thereof to the Member; and if the said subscription shall continue in arrear at the expiration of six months after such notice, the Council having through the Secretary given the defaulting Member due notice of their intention, shall have power to strike the name of such Member off the register, and he shall thereupon cease to be a Member of the Society.

76. Any person whose name shall have been struck off under the fore-going bye-law may, on payment of his arrears, be re-admitted by the Council.

77. It shall be the duty of the Treasurers to recover from persons who shall have ceased to be Members, any arrears which may remain unpaid.

78. A meeting of the Council, consisting of not less than five members, shall have power to remove any member from the Society, upon receiving a requisition to that effect, with the reasons stated, signed by not less than twenty members of the Society.

79. Every Member whose subscription is not in arrear is entitled—

To be present at, and take to part in, the proceedings of all the Ordinary Meetings of the Society, and to introduce visitors at such Meetings, subject to such rules as the Council may frame from time to time.

To be present at and to vote at the Annual and all other General Meetings of the Society.

To receive the Society's Journal.

To introduce, either personally or by note addressed to the Secretary, any number of friends to inspect the models, paintings, and works of art in the Society's house, between the hours of ten and four o'clock on any week-day, except Wednesday, and such other

days, and under such conditions, as the Council may direct.

To the use of the Society's library, and to borrow books therefrom, under such regulations as the Council shall from time to time prescribe.

The Society's house will be closed to visitors during the month of September.

XII. ASSOCIATED INSTITUTIONS.

80. The Council may admit into union with the Society, Literary and Scientific Institutions, Philosophical Societies, Mechanics' Institutions, Chambers of Commerce, and other Societies whose primary objects shall be the promotion of Arts, Manufactures, and Commerce, the Chartered objects of this Society.

XIV. ELECTION OF OFFICERS.

81. The President, the Vice-Presidents, the two Treasurers, and the twelve other members of the Council, the Auditors, the Secretary, and the Collector, shall be elected annually by ballot, at the Annual General Meeting for the election of officers, as in Sec. IX. appointed to be held, and shall go out of office at the next Annual General Meeting.

82. Previous to the Annual General Meeting the Council shall by ballot prepare a list of persons to be President, Vice-Presidents, Treasurers, and other members of the Council, Auditors, Secretary, and Collector and Financial officer, for the ensuing year, and such list shall be framed as follows, viz.—

a. To contain the name of one member of the Society as President.

b. The names of twenty members of the Society as Vice-Presidents, provided that four at least shall not have served the office of Vice-President during the then current year.

c. The names of two members of the Society as Treasurers for the ensuing year, provided that one of them shall not have served the office of Treasurer during the then current year.

d. The names of twelve members of the Society as members of the Council for the ensuing year, provided that four at least of such twelve persons shall not have served on the Council at any time during the then current year of office.

e. The names of two members of the Society as Auditors for the ensuing year, provided that one of such members shall not have filled that office during the then current year.

f. The names of the persons proposed respectively to fill the offices of Secretary and Collector and Financial officer, one name for each office; such persons not to be members of the Society.

83. The list so prepared shall be suspended in the Society's room for seven days previous to and until the General Meeting, and shall be the balloting-list at such General Meeting.

84. The balloting list shall be published with the Journal of the Society on the Friday previous to the day of election, and a copy sent to every member of the Society.

85. The ballot shall be taken at the Annual General Meeting, and shall remain open not less than one hour, and shall take place in the following manner:—

The Council shall cause to be provided for the use of members voting thereat a sufficient number of copies of the balloting-list; and no other balloting-lists than those so provided shall be received.

Every member intending to vote at the election of officers may, if he shall think fit, erase any name or names from such balloting list, and may substitute in the place thereof the name or names of any other duly qualified person or persons, and shall hand in to the Chairman such balloting-list as aforesaid, either with or without such erasure and substitution of names.

On the receipt of such list from the voter, if the voter's qualification to vote be not objected to, or if objected

to, and the Chairman shall be satisfied that the voter is duly qualified, the Chairman shall deposit such list in the balloting-box. The decision of the Chairman in the matter shall be final.

Two Scrutineers shall be nominated by the Chairman, who shall examine and cast up the votes, and report the names of the persons so elected and the number of the votes to the Chairman, who shall thereupon declare the same to the meeting.

Any balloting-list containing a greater number of names proposed for any office than the number to be elected to such office, shall be absolutely and wholly void, and shall be rejected by the Scrutineers.

If the votes in any case be equal, the Chairman shall give the casting vote.

86. In the event of a vacancy occurring in the Council, or in the office of Auditor, Secretary, or Collector and Financial officer, the Council shall duly fill up the same till the next Annual General Meeting.

XV. ALTERATION OF BYE-LAWS.

87. Bye-laws may be altered, varied, or revoked, and new and other bye-laws made, at General Meetings only.

88. No motion to alter, vary, or revoke any existing bye-law, or make any new or other bye-law, shall be entertained by a General Meeting, unless the same shall have been proposed by the Council; or unless notice in writing, signed by twelve Members containing the substance of the proposed motion for altering, varying, revoking, or making any new or other bye-law shall have been given to the Secretary ten days at least previous to the holding such General Meeting.

ON NEW FARINAS AND STARCHES.

By P. L. SIMMONDS.

I cannot but think that too little attention has been given to the subject of utilizing, in a commercial point of view, the very many edible seeds, fruits, and roots, of the Colonies which yield farinaceous substances, and a stimulus might probably be given to production for export of many useful and cheap farinas and starches, which would prove useful both for food and for the services of our manufacturers, who now trench largely upon grain for starches for stiffening purposes.

The tuberous-rooted plants—the varieties of yams, eddoes, cocos, &c., are exceedingly numerous and exceedingly prolific. I learn by recent advices from Jamaica, and I know it from experience of old, that there are parts of that island and of many others, such as Trinidad, and I may also name Demerara, where the yams are raised so abundantly, that although they send much to other localities, they grow more than they can find a market for, and hence they are obliged to feed the hogs on them.

The yam hills and provision grounds could be made to yield much more if it were generally known that excellent bread may be made out of the meal or flour, and that a demand could be created in England for the meal.

At a late meeting of the Council of the Jamaica Society of Arts, a small quantity of loaves was produced, made from yam flour, under the superintendence of John Daughtrey, Esq., of the Kingston Penitentiary, which were pronounced excellent by all who tasted them, and the following were the directions given for making the bread:—

“Take one lb. of flour of white yam, (which is prepared by slicing, drying, and beating in a mortar, and is then passed through a sieve, or prepared in the same way as arrowroot,) out of which take five ozs. and make a leaven. When the leaven is fit for use, add the remainder of the yam flour and mix it into a dough, then add four ozs. of wheaten flour; rub them up together and the bread is prepared. The reason of adding the wheaten flour is to make the yam flour knit together.”

At the monthly meeting of the Society of Industry for the parish of Hanover, held at Lucea, Jamaica, on the 7th of August, the hint was also worked out. Mr. Gordon produced 3 lbs. of flour made from 25 lbs. of the negro yam by grating, which was perfectly white and pure, and it was stated that the refuse of the yam, after undergoing the grating process, was still valuable for feeding stock, and even for human food.

The secretary, Mr. W. Browne, also produced several new kinds of flour. Two specimens from the negro yam; one made by grating, as arrowroot is usually made, and another, coarse kind, produced by beating the yam (after being sliced and dried in the sun) in one mass. Cakes made from this latter description of flour were produced.

Two specimens of flour from the bread fruit were also shown, made in the manner above described.

Cakes made from the plantain without any admixture of flour were also produced. The fruit was merely cut up, dried, and pounded.

A cheap grating or rasping machine for roots for making starches is much required, and I have had frequent applications for such an one from colonists. Attention is now being paid to the production of arrowroot in Honduras, Natal, Moreton Bay, and other colonies, and a specimen of arrowroot I received a day or two ago from Natal, will compare favourably with most of the West India starches for colour and grain.

Ceylon has also gone into the manufacture, and if some of our merchants would give encouragement to the introduction and sale of arrowroots, tapiocas, cassava flour, batatas, sagos, &c., they might be much cheapened and employed for many other purposes even than nourishing food for the rising population.

The high prices commanded by grain in Europe, renders the present a remarkably favourable time to ascertain what can be done in this branch of tropical agriculture.

The sweet potato (*Convolvulus batatas*) of Linnæus, is another common root in the West Indies, and one of the most valuable vegetables of the Southern States, but not so generally prized or cultivated as it ought to be. The crop is always sure,—at least I have never heard of any blight befalling them. They are easily cultivated, and, with proper care, may be kept through the winter and spring, till new ones come. There are several varieties, and some of them grow to a great size, weighing several pounds.

The French horticulturists have been experimentalising successfully in the introduction of several new tuberous roots to aid the potato. Several of these, and a variety of other useful plants, for food and manufacturing purposes, I called attention to a year ago, in my work on the Commercial Products of the Vegetable Kingdom.

The green bitter cassava, when properly cultivated, will yield 25 tons to the acre, and this will give one fifth of its weight in starch. Five tons of starch, at say 6d. the pound, would give £56 per acre. Such a return as this would enable the West India colonies to inundate Great Britain with food, and at a rate which would make flour be considered a luxury. The meal of the cassava is in extensive use all through Africa and the Antilles, and is almost the only kind of farina used in Brazil. It is the moussache of the French colonies, and sometimes comes into commerce under the name of Brazilian arrowroot.

The coco or eddoe (*Arum esculentum*) is the chief support of the negroes.

Although seldom cultivated with much attention or care as to the amount of yield, an acre of land is capable of producing 4½ tons of yams and the same quantity of sweet potatoes within the twelve months, or nine tons per acre, whilst, as an article of food, the tropical root is twice as nutritious as the ordinary potato. Some mode might probably be adopted of drying these roots for export. In Peru, potatoes are dried by the severe frosts in

the mountains, and powdered; they are called chimo, and will keep for any length of time. Another plan there is to boil and peel them, and dry them in the sun.

Various species of *Canna* furnish the large shipments of amylaceous substance imported from the West Indies under the name of *Tous les mois*. The manner in which salep has been cheapened by the introduction of other equally useful feculas shows the importance of greater attention to this profitable branch of tropical culture.

People in general know but little how much of the staff of life is consumed in stiffening their collars. In the United States the production of starch is on an enormous scale. There is one starch factory at Oswego, in New York, the buildings connected with which cover nearly three acres of ground, and where they consume 200,000 bushels of Indian corn, and turn out 4,000,000 pounds of pure starch, and 300,000 pounds of pulverised, for culinary purposes, annually; and yet they are unable to supply the demand. The process is extremely simple. The corn is first soaked in pure water, then ground, and passed between heavy iron rollers, which press out the gluten, and all diluted with filtered water, passed off into vats, of which there are 284, holding 280,000 gallons. It is then left for a few minutes to settle, when the starch-water, drained off by syphons, is passed into other vats, where it is left until the starch settles in cakes at the bottom. The water is then drawn off, and the starch, cut up in blocks, is placed in the drying-house, heated by steam, and afterwards prepared for putting up. Potatoes, as is well known, are also largely consumed for starch both in America and on the continent. One manufacturer at Hampden, in the United States, uses 2,500 bushels per day. Another manufacturer at Mercer, Maine, grinds from 16,000 to 24,000 bushels annually, and makes 140,000 to 240,000 lbs. of starch. In a single district in Bavaria, 400,000 lbs. of sago and starch are made from potatoes, 100 lbs. of the root furnishing about 12 lbs. of starch; in some kinds analysis shows 15 per cent. of starch, and the proportion of water in the root is about 75 per cent.

In the East, arrowroot is obtained in large quantities, and new sources of farinaceous supplies are daily being found; witness the *zamas* of St. Domingo and Western Australia.

The per centage of starch yielded by the different tropical roots, according to the investigations of Dr. Shier at Demerara, were as follows (but, as a matter of course, the quantity yielded will vary with the season, the soil, the climate, age, ripeness, and length of time the roots have been out of the ground):—Sweet cassava, 27 per cent.; bitter ditto, 16 to 25 per cent.; common yam, 24½ per cent.; arrowroot, 17 to 21½ per cent.; Barbados yam, 18½; tannia (*Caladium sagittifolium*), 15½ to 17; Guinea yam 17; buck yam, 14 to 16; sweet potato, 16½; plantain meal, 17 per cent. In view of the largely extended culture of the plantain by companies now organising for its fibrous products, it is worth while to consider what uses its meal may be applied to as a commercial article. As food for children and convalescents it would probably be much esteemed in Europe, and it deserves a trial on account of its fragrance, and its being exceedingly easy of digestion. In respect of nutritiveness, Dr. Shier classes it above the pure starch, on account of the proteine compounds it contains. The sun-dried cores might be exported, leaving the grinding and sifting to be performed at home. 20 to 25 per cent. of meal is obtained from the plantain, or 5 lbs. from an average bunch of 25 lbs.; and an acre of plantain walk, of average quality, producing during the year 450 such bunches, would yield over a ton of meal, this, even at 6d. a lb., would be a gross return of £56, exclusive of the stem for fibre and paper. The riper fruit, dried in the sun, as in Mexico, where it is known as *plantado pasado*, would sell readily at home.

5, Barge-yard, City, Oct. 25th.

ON VESSELS OF WAR.

By LADY BENTHAM.

Whether a given amount of force be the more efficient if concentrated in large vessels of war, or whether if divided in a number of small vessels, is a question that seems worthy of more ample discussion than it has yet received. The subject was indeed considered by the late Brigadier-General Sir Samuel Bentham, in his "Naval Essay," p. 68 to 90, and as that essay is extremely rare, an abstract of it may not be unacceptable to readers of the *Journal of the Society of Arts*.

Sir Samuel stated his observations on the matter under the head of "General Efficiency of the Vessel of War." He enumerated the several advantages of large vessels, and then specified those resulting from a division of a given force in small vessels, those vessels being of a light draught of water, and armed with ordnance of a large calibre. He first mentions, as the chief objects of vessels subservient to naval warfare: the distressing the enemy "on his own coasts" and interior waters, as well as on the "open sea;" the defence of our own country against hostile attacks, by impeding the navigation of the enemy's commercial vessels; the protection of the commerce of our own country; the prevention of contraband trading; the conveyance of the military personnel; the transmission of orders." These various services may well, he says, be supposed to require different descriptions of vessels, nevertheless it must appear highly desirable that every vessel, when prepared for one of these services, should at the same time be more or less fit for the other services.

The chief desiderata in a vessel of war are as follows:—warlike force, "accessibility to all places to which navigation can be extended," spaciousness of stowage room, power of locomotion, strength of structure, continuance of efficiency, including security against destruction.

Considering that the armament of vessels actually employed in naval warfare varies from a single gun to "as many as 120" (now still more), "and that, if requisite, the bulk of a vessel might be increased so as to admit of a far greater number, it seems highly important to investigate the advantages and disadvantages of large and small vessels."

"In favour of large vessels mounted with many guns," * * * it may be said that "their action is concentrated, and therefore more efficient when the attack is directed against one particular object," that some of the guns in a large vessel are in a more elevated position than they can be in a small one, therefore may in some cases be rendered more efficient; that the guns may be traversed for the purpose of taking aim, the large vessel being less tossed about than a small one in a rough sea; that the sides of a large vessel are thicker than those of a small one, therefore are better protected from the enemy's shot; that the large vessel may be more susceptible of locomotion than a small one.

On the other hand, in favour of small vessels it may be observed that, the larger the vessel, the more liable it is to be struck by the enemy's shot, especially when her broadside is turned towards him, as it must be in firing a broadside; supposing the shot thrown by the small vessel to be of a large size, and of the most destructive kind in use, a single one of such shot may be sufficient to destroy even the largest ship; that in all small vessels, above what are denominated boats, not more than half the number of guns can be brought to bear upon the enemy; a given number of guns mounted in small vessels, instead of large ones, might either be directed against different parts of the same object, or towards different objects, at pleasure; supposing a single gun, or a few guns only, to be mounted on a small vessel, either at the head or at the stern, and so fixed as either to be elevated or depressed, the horizontal pointing may be effected by directing the vessel itself, whereby the guns may be duly pointed, worked with fewer hands, and fired much oftener in a given time, than if mounted as usual on board a large vessel,—as in the

latter case they must be traversed on the deck by hand-spikes; guns so mounted would be *all* of them efficient in all weathers, whereas no more than half the number can be brought to bear upon an enemy if mounted as usual, on both sides of a ship; in a large ship a less number of guns can be used when the weather obliges the lower deck port-holes to be closed; if larger guns than any now in use should be employed, the mischievous effects of recoil would be less than in a large vessel, since a small one would itself easily yield to recoil; the smaller the vessel, the less likely it is to be struck by the enemy's shot; the destruction of a small vessel would occasion but a small loss of either money or effective force; supposing a fleet of small vessels to be attacked by a superior force, the greater number of them could retreat whilst that superior force was engaged with a single small vessel; small vessels can be rowed, a circumstance of minor importance since the introduction of steam-vessels; the masts of a small vessel can be lowered so as to avoid their destruction; small vessels can lie nearer the wind than large ones; a single well-directed efficient shot is capable of destroying the largest vessels; "when several such small vessels are *united under one command*, they may be arranged in a line, X X, or in any other figure, conformably to the rules of tactics." "But the greatest advantage of a small vessel in point of efficiency for naval warfare, especially when such bulk as is indispensable is obtained by length and breadth, arises from its capability of being navigated in *shallow water*; its destructive apparatus may be brought to act against the enemy's vessels in the smallest and shallowest of their ports and harbours, unobstructed by the bars and shoals by which the entrance to many of them is closed." "Another advantage of a small vessel, arising from its little draught of water is, superior co-operation to the land-service, bringing the material and personnel close into the shore, affording the protection of guns during the time of debarkation." A small vessel drawing little water may in shallow water often escape the pursuit of a much superior force.

The General then observes that should attention be directed to the employment of vessels drawing little water, the question would present itself of "What is the specific number of guns with which each vessel should be armed? and, what should be the size and draught of water of the vessel?" These questions, he says, can only be decided after investigation of the size and description of shot found to be the most efficient; but for the purpose of forming some idea on the subject, he says, it might be assumed that guns of the largest size known should be employed, as those used for the defence of the Dardanelles, which threw shot of above two feet in diameter, but as this might really be beyond a desirable size, all circumstances considered, he assumes that a shot of eighteen inches diameter would be the largest requisite.

He then alludes to many difficulties which would occur on mounting even so many as ten such guns on board the same vessel, stating that "ten such guns on board of as many vessels, would in most cases be found to constitute a fleet more formidably efficient than any that has yet existed;" that such a fleet could be "built, equipped, and manned, in less time and at less expense than is requisite to provide a single ship of the description now thought necessary for the attainment of the general object of naval warfare."

He then considers the specific size of a vessel suited for armament with such a gun, supposing the services required should not demand an absence of many weeks from a supply of stores, and that it be provided with the established greatest supply of shot and ammunition, a hundred rounds; and says, that although ten or twelve men might be a sufficient crew, yet, doubling that number, "I may venture to mention a length of sixty feet, with an extreme breadth of sixteen, and a draught of water of about four, as amply sufficient for the purpose." But as cases often occur when it is desirable not to destroy, but to capture, an enemy's vessel, it may,

he adds, be advisable, in addition to powerful ordnance, to arm such a vessel with a long gun of small calibre, "perhaps a six-pounder turning on a pivot, without recoil, and half-a-dozen very light pieces of the same bore, mounted like swivels, and removable to either side of the vessel." Even smaller craft have been safely navigated in the open sea. He adds, however, that "it does not follow that all the vessels in every armament should be limited to this size."

He then observes that "the chief objections to great bulk apply to the great draught of water, and that no insurmountable objection has yet presented itself to extending the length and breadth of a vessel."

His next consideration is that of fitness for the conveyance of the material and personnel requisite in warfare, a subject not entering into the object of this abstract.

Sir Samuel concludes this subject as follows:—"Should the above considerations render it apparent that small vessels might for most services be made more efficient, as in all cases they would be more economical, than vessels of the largest sizes, still the prospect of abandoning the use of large ships can scarcely be looked upon without sentiments of deep regret. Who that has beheld a first-rate, armed, manned, and under sail, guided in its rapid course by the easy effort of a single hand, can forget the sensations of delight and admiration created by this imposing spectacle? Accustomed to consider such a ship as the finest specimen of perfection in the highest branch of constructive art—as a locomotive engine containing within itself the most complete concentration of warlike force—or as that tower of strength by means of which our national security and honour has been created and maintained—with such sentiments, who would not be anxious for the continuance of its use? And those who have passed the greater part of their lives in these floating castles, who by their skill and valour in the employment of them have gained the highest professional fame, and great national rewards, with what reluctance must not they entertain the idea that these objects of their early attachment are no longer to be depended upon for the support of our naval superiority? Yet it can scarcely be deemed prudent that, yielding to such sentiments, we should neglect the introduction of that description of vessel which investigation shall have shown to be the best for the general purposes of warfare, waiting until its superior efficiency shall have been proved to us by the success of some enemy,—until we may be thus compelled in self-defence to become the followers when we ought to be the leaders in naval improvement."

Home Correspondence.

CORT'S INVENTIONS.

No. III.

SIR,—One of your correspondents has proposed the formation of local committees in the seats of the iron trade, to aid Mr. Richard Cort in bringing his unparalleled claims on public justice before the House of Commons in the ensuing session, and that a central committee for concentrating their exertions should be formed of members of the Society of Arts in London. That the successful agitation of measures to obtain redress for the greatest "discouragement" to improvers of "Arts, Science, and Commerce" ever inflicted in the history of merit,—acts more barbarous than the confinement in Paris of the first inventor of the steam-engine as a lunatic,—would redound to the honour of your Society and the objects for which it is instituted, tenfold more than any effort which can possibly at present engage their attention, no one will venture to deny. But the first step towards any success is to have a full appreciation of the difficulties to be encountered. We all know that it is not mere abstract justice, but what is called *influence* and example which

moves masses of men and public bodies. Justice is blind-folded, and sits with the scales to weigh what is brought before her. She is impassible, and, being sightless and seated, cannot move. It was not unaided justice which brought the pillaged inventor his wretched pension of £200 a year. It was the "influence" of Samuel Thornton, M.P., Robert Thornton, M.P., John Hunter, M.P., Alderman Curtis, M.P., Alderman Le Mesurier, M.P., Sir George Jackson, M.P., Brook Watson, M.P., Francis Annesley, M.P., George Smith, M.P., Robert Smith, M.P., Sir Watkin Lewis, William Chute, S. and J. Angerstein, J. Ewer, and S. M. Wilson, bankers and merchants of London, who of their personal knowledge of the high character and conduct of Mr. Cort, and the miserable red-tape treatment, to call it no worse, under which he had been sacrificed as the return for unexampled national benefits, addressed Mr. Pitt in his behalf in 1794, and obtained the paltry pension thus accorded to influence which to justice had been denied. The names of those men are for ever honourable for so using that influence, and we cannot and must not doubt that even out of the limbo of joint-stocks and jobbing which has since been created in the metropolis, that fifteen names equally honourable are at any time ready to lend their influence to vindicate the national honour; but these noble characters *knew* the inventor and the facts; the present difficulty is now, after such a lapse of time, to succeed in impressing such a body of men with the force and sense of the true facts. It is true that lapse of time has magnified, to a degree that would have been deemed incredible, the claims upon public gratitude. Those who will take the trouble to inquire into the realities, know past controversy, that but for the merits of Mr. Cort, the commerce not only of this country but of the whole world would have been comparatively at a stand-still. It is not merely the money saving of 300 millions in the cost of iron in the past 63 years that has to be taken into the account, we have to ask where was the amount of iron which made that value to have come from? If the 75,000 tons of foreign iron imported at the date of these inventions cost an average rate of £35 per ton, where could any supply have been obtained at any price commensurate to the demands of the war which followed? Indeed, I should be glad to hear how that war could have been carried on at all and brought to a triumphant issue but for the gifts of Mr. Cort. A great deal has been said upon the surprising elasticity evinced by the resources of this country during that prolonged struggle. The mechanical skill in appliances developed in numerous manufactures, has been rightly assigned as the supporting principle which imparted that vital energy which threw off increasing burdens "like dew-drops from the lion's mane." *Vires acquirit eundo* was the motto of the tremendous contest, and our machinery was doubtless the prime mover in the energetic march. But whence came that machinery; its rise and its results are admitted as a notoriety, but where were the main-springs of the creation? I say in the inventions of Henry Cort for puddling and rolling bar iron, inventions for which the government gratitude was to plunder him in his life, and the national gratitude to honour the memory of his name by leaving four surviving children advanced beyond the span of three-score years and ten in indigence. Oh! great dishonour to a nation whose fleets now cover the seas, and whose armies boast to be engaged in vindicating the progress of civilisation from oppressors. Can any man know the facts of the treatment of Mr. Cort and his descendants, and look in his neighbour's face without shame, in the midst of so much pompous hypocrisy? It is only very lately that I have become acquainted with the *full* particulars of the case, and I am appalled at their aspect. Surely those who believe that great crimes are followed by great judgments, and that ingratitude is the blackest stain that can deface God's image, either in the individual or in the aggregate, must look with dread on the outrage and neglect received by that man and his descendants

who was the instrument, under Providence, of making this country what it is, and saving it from what it *might have been*. I, for my part, feel a relief in knowing that the opportunity for some atonement is not entirely past. What has *been done* cannot be recalled. We cannot order the declining shadow on the dial of life to go back even one degree; it is but little that now remains to do for the future, but that little is *possible*, and every true lover of his country may thank God that He has yet spared us some living altars where offerings of expiation may be laid. Examine without evasion or extenuation the simple facts. The price of iron of a serviceable quality before the commencement of the last war, was £35 to £40 per ton, and we were dependent on foreign countries for that supply for the mere ordinary demands of our shipping, and the then by comparison infinitely limited home consumption. Now, I ask, what after half a dozen years of that war would have been the price of iron if in the interval Mr. Cort's new machinery had not enabled 20 tons of iron to be made with the same labour, in the same time, previously required to make one ton, and that one ton of a quality useless for the purposes to which the 20 tons equal to the best foreign could be applied? Would £100 a ton have covered in 1800, without Mr. Cort's inventions, the price of serviceable iron, and, subsequently, when the depreciation of our internal currency was at its height, would £200 a ton have covered it? Assuredly not, if it could have been bought at all, to the extent of those innumerable uses which puddling and rolling had enabled us to create. But it neither could nor would have been bought; those uses would not have been created; machines made that vast development of wealth which enabled us to support the war, *but it was Cort's iron which made the machines*. They could never have been constructed by the purchase of the infinitely costly foreign iron. If the steel of our weapons in the field won the immediate victory, it was the *bars of iron* at home which furnished the sinews of the war; and I leave it to statisticians to disprove if they can this assertion, which I make in the broadest and most unqualified sense, that but for the inventions of Cort it would have been utterly impossible for this nation to have withstood the efforts of the great Emperor who had subjugated Europe, and made its whole combined resources of men and material available for our ultimate conquest. I do not hesitate to say, whether or not it has been said before, that but for the internal resources developed by the inventions of puddling, and especially the rolling of bar iron in grooved rollers, it would have been by a miracle only if this country had not succumbed *before superior force*. God willed it otherwise, and we have rewarded the instrument of his mercy. Rewarded him as national benefactors are wont to be rewarded by *our laurel crowns*. Foudrinier, who by applying a similar process of rolling to the production of paper, wrought a similar development of that manufacture, and has thereby given us the *Times*, was ruined and beggared by our patent laws, though most happy I am to see that the eminent manufacturers have lately been engaged in a subscription for his destitute family.

Now though these facts are not denied, for they are undeniably established by the letters of Mr. Robert Thompson, uncle of the late lamented Alderman Thompson, and of a host of the contemporaries of Mr. Cort, as seen in Mr. Richard Cort's review, that generation of ironmasters has passed away. Multitudes of those now using Cort's processes, know nothing of their origin. Some think that rolling came by nature, and was never invented at all; others are too much occupied in rolling and selling thousands of tons per week, to have time to think who it was that enabled them to do so. Some men of high honour and known liberality of sentiment, feel, as is natural, the claims of private friendship a stronger tie than abstract points of justice, and fear to move in the latter lest censure might be implied in the former. And I find a feeling which it is obvious we might expect, an aversion to *move first* in a matter which has been so long suppressed.

It is a proper and a commendable feeling which dislikes coming prominently forward without some special individual call for doing so, averse to incur an imputation of assumption, or to impute an appearance of past neglect on those he seeks to lead. Only last week it was admitted to me to be a "very bad case, but that it would happen daily if there were as many Cort's as days." I trust this is not a fair estimate of our national character, but in the midst of all these ignorances, hesitations, and uncertainties, it has struck me that the most efficacious course for success will be to *begin at the other end*. To convince Government that the pension of £200 a year granted to Mr. Cort, and from which, with a wise economy, £75 was struck off at his decease, the better to comfort his widow for her loss, and enable her to educate and provide for a family of orphans, was *not* a full, munificent, and noble recompense in discharge of injury, may prove difficult. To convince the present generation of ironmasters that the £1000 subscribed by their predecessors to that widow, through the manly efforts of Mr. Robert Thompson, was not an ample share of millions of profit then and since derived by the trade, might likewise involve some difficulty. To convince the House of Commons that the Committee of 1812 came to a decision so monstrously opposed to the evidence, as Mr. Cort's review demonstrates, overthrowing the testimony and resolutions of the whole trade throughout the kingdom, to accept the random or inexperienced assertions of two individuals, may likewise involve time and difficulty, and when life is ebbing there is not much time for debate. So also it may need time and powerful arguments to convince the Treasury that the pensions of £19 a year granted to Mr. Cort's two daughters on the demise of their mother, as an appropriate further fragmentary diminution of the widow's mite, is not already an intolerable and ample burden for the crippled resources of this country to bear for so plebian a service as the creation of the iron trade. These three, the Treasury, the Iron Trade, and the Legislature, have already been appealed to, and they have each done something. Whether they are proud of the measure of their gratitude, and are prepared to say, we have done what we could to annoint this inventor to his burying, no one can deny that they have done a little. What, then, occurs to me is that there is yet a fourth estate, which has not been given the opportunity of emulating in this race of gratitude, namely, those to whom Mr. Cort has given neither riches nor poverty, as in the case of the others and himself, but who, through him, feed on their *daily bread*. The working iron-makers have not those difficulties in the way of a natural emotion which beset the

"—— Atlantean shoulders fit to bear
The weight of mightiest monarchies."

They need offend no authorities, censure no friend, by showing that they are grateful. I am mistaken if there is not a spirit amongst them which would feel proud to set the example, even by a penny subscription, of what humble men can do in a public cause. They evinced far more zeal and honourable sense than their superiors of the benefactions of Mr. Cort, when the trials at the dockyards of the puddled and rolled iron declared the independence of Great Britain from that moment of a supply of foreign iron; with a rude impulse, which it would be well if our statesmen were more prone to emulate, they showed their sense of the magnitude of the fact, by carrying the successful discoverer in a procession of triumph. What would these men have then felt to be told that the reward of his triumph was to be the crushing their benefactor by the officials of the nation he had served, and a starving allowance doled out, as if in mockery, to his children. Truly, they would say, Lazarus was not the only beggar who had sat at the rich man's door—a position here infinitely aggravated by the fact of the rich man's wealth being the outcast's gift—that he owed his pomp to the poor man at his gate. Were I to say that a million mouths in this country are daily fed by the deceased Mr.

Cort, I should be vastly under the mark. 10,000 tons of iron per day are now produced in Great Britain; not less than 30 men daily are engaged upon each ton of iron in the direct processes of manufacture and in raising minerals, and the collateral and subsequent employment afforded is enormous. None can so well appreciate as the working men employed in the rolling of bar iron what Mr. Cort has done for them. Ask the men who made the vast specimens of rails in the Paris Exhibition when, and in what figure, they would have reached their destination, had there been no other means but forging them with a hammer. The very commonest rails could not have been exhibited even as *tours de force*. Tell these workmen that 70 years since their familiar rolls had no existence, and that it required the same labour and time to tediously forge ten tons of iron into comparatively useless shapes of comparatively worthless quality, which now turns out over 200 tons of rails and other forms that else would have been altogether impracticable. Tell them the author of this benefaction was pillaged by dominant authority, and left to die of a broken heart, under the withering destruction of great and honourable prospects, and that his children, for aught such authorities care, might be left to die in that common receptacle where all distinctions in life are levelled, as a kind preparation for the last levelling in the grave. Rely upon it that strong arms have hearts strong enough not to be terrified at contributing a penny each towards the preliminary expenses that must be incurred in bringing this matter publicly before the nation's representatives. The children of the pillaged cannot afford to do it; they have already had to pay the bootless costs of one such application, for though the Committee engaged they should be paid, a broken faith never permitted it to be done. The honour of the first contributions will lie with the children of those men who bore their benefactor in triumph; the offering, however small, will be the offering of *real* gratitude, not, as heretofore, a miserable compromise of overpowering claims. The numerous Institutions in the provinces in correspondence with your parent head will form admirable local committees for advocating the cause and collecting the subscriptions. It would not be the first occasion on which the generous impulses of the masses (for it is natural, "if nothing checks," for men to thank those who serve them) have set an example to waken eminent and frigid apathy. Some preparation will be made at once for the harder task of driving great camels through the needle's eye, and greatly assist the operation. Your valuable Journal, circulated in these Institutions, will teach the worker how inventors, the parents of his craft, who give bread to millions in every region, are suffered like dogs to gather the crumbs which fall from their own table, the rich banquet which Cort spread for all nations, but especially for our own; and how the Treasury, which he has filled, honours itself by according to the daughters of the man who has created more wealth than ten centuries would have accumulated without him, a maintenance which the most niggardly private gentleman would blush to make the provision of a faithful domestic. These things ought not to be. If statesmen are not ashamed to show an ignorance or indifference of the source of the astonishing fiscal resources during the present century of our sea-girt patch of land, it is in the power of the hands of labour which support the state to make them so, and stimulate apathy to a comprehension of the grandest lesson in political economy. Whether the eminence be in *arts* or *arms*, it is alike discreditable to a nation *highly civilised* to suffer to be heard in its streets the ancient cry, *date obol Belisario*.

I am, Sir,

Your obedient servant,

DAVID MUSHET.

October 16, 1855.

DECIMAL COINAGE.

SIR,—Your correspondent Mr. Good has, in yesterday's *Journal*, noticed what I am sorry to find he still considers, "a grave *philological* objection to the adoption of the tenpenny system, as advocated by Mr. Theodore Rathbone and others." His former letters, and those which he has done me the favour of addressing to myself, and the useful and interesting correspondence to which they led, induced me to hope, not only that he would have seen the futility of this *grave* objection at all events, but that having in many respects adopted such just and well considered views on this subject, he would have now perceived that *there is and can be but one possible scheme* for carrying them into effect, and that, fortunately, far the simplest and the most efficient and complete, as well as the easiest of execution, that has ever yet been proposed.

Mr. Good, like Mr. Laurie and Mr. Minasi, both originally avowed and able advocates of the mil system, and indeed in common with almost every one who unites to thorough scientific, *practical* knowledge of figures and of business, and who has ever fairly considered the two modes of proceeding, now admits as a fundamental principle—1st. That "*such a proposal as the millesimal division of the pound, as the basis of a new system, must be abandoned,*" and this on grounds which have been again and again fully stated, and hitherto found unanswerable; and 2nd, states, "*that the sacrifice of the pound would be attended with enormous inconveniences, for which the advantages of the best possible decimal system would by no means be an adequate compensation.*" And your correspondent, Mr. Gurdon, who writes to call attention to *his* having advocated this millesimal division of the pound in 1852, and who, to use his own words, "swears" by the pound, and seems inclined to swear at all those who would retain the penny, very justly observes, that, 3rdly, in effecting the alteration, "*the less change the less prejudice to be overcome, and the more easily would the new system be comprehended, and, when comprehended, if founded in good sense, the sooner approved.*"

Now I would put it to the common sense of any one who has at all carefully and impartially considered the subject, whether, such really being the facts, as so generally admitted on both sides, the required result can be so entirely accomplished, or can be accomplished at all, by any system but that which I have advocated, REQUIRING SOLELY AND SIMPLY THE EXCHANGE OF THE TWELVE PENCE FOR THE TENPENCE AS OUR FUTURE MONEY OF ACCOUNT, that pence and tenpence should become our legal, and hence ordinary and usual form of account. Thus at once rendering all accounts of the poorer and less instructed classes, strictly and absolutely decimal, with accounts of every description such as would require no coins but the existing wholly unchanged in value and denomination, and entirely and at once freed from the troublesome duodecimal addition of the pence, but with the pound still retained as the recognised established expression of large amounts, and until this new and *only strictly decimal* system of accounts had become universally familiar, in short, for every useful purpose it can ever serve? Would Mr. Gurdon's pound and mil scheme, requiring the abandonment of *all* our present moneys of account but the pound itself, and all our lower coinage, (involving, according to the high authority he quotes, the recoinage of 700 millions of pieces, and a period of at least 20 years to substitute the new coinage for one with which it is *incommensurable*, unexchangeable without remainder), at all meet, as my proposal would, *his own conditions*? And if it is feared that with so little of compulsion and interference, this invaluable, because purely decimal, literally *all ten* form of account, would be confined to amounts and calculations below the £, and although required in legal and official accounts, would not be taught by the schoolmaster and introduced generally into calculations, let any one entertaining such doubts compare the working of any common calculation or sum on the two systems,

and he will be satisfied by the enormous saving of figures and labour, how rapidly, universally, and certainly, the decimal would make its own way.

I will not trouble you with the figures, but if a fair average example is taken, as for instance, 31 ton, 12 cwt. 2 qr. 14 lb., iron rails at £12 12s. per ton, (not of course by any means so forcible an illustration as one into which pence are introduced) it will be found that by "rule of three," as required in the government offices, 156 figures are required to make the calculation, and by "practice" (counting the fractions as single figures, and employing every possible abbreviation of the work) 56—whilst working by the decimal system I advocate—our present pence and our present pounds avoidupois alike advancing by tens,—7085.4 lb. at 1.35 pence per 10 lb.,—gives the result, (£398 11s. $\frac{2}{3}$ d.,) with but 31, or, as if this and many such calculations could be easily worked with *only* 25 figures.

But Mr. Good, whose laborious and patient attention to the subject is deserving of the highest praise, gives up all present hope of a decimal system, and proposes one in which there would not be a single strictly decimal feature, and thinks that the above mentioned *immense* economy of labour and time, in education and in the business of life, could not be realised, from the *philological* objection of requiring people to say, "two tens for twenty, three tens for thirty, two tens and five pence for twenty-five pence, &c." Can he seriously doubt that when the tenpence had taken the place of the twelve pence in our accounts, the expression six and sixpence ($6 \times 6d.$) would as much and as clearly signify six tens and sixpence (*i.e.* 5s. 6d.) as it now does six twelves; and why, in the name of wonder, should people say "two tens, &c.," instead of twenty pence, thirty pence, or half a crown, &c., *exactly as they do at present*?

With reference to my suggestion of rendering by "negotiation" the silver coinage of those great leading decimal systems, the franc, the florin, and the dollar, *international, and exchangeable with our own and the accounts of all*, to this extent corresponding, by, in the first place, as we so easily might, rendering the silver representing the English tenpence and the French franc *exactly identical*, I am much gratified to observe a similar proposal with respect to the dollar of the United States, in an excellent statement just printed at Paris, "*Sur le Système Métrique*," by Mr. W. W. Mann. Although a warm and able advocate for extending the decimal system of France into his *own* country without further delay, for which petitions are about to be addressed to the American Government, Mr. Mann wisely deprecates *unnecessary* interference with their existing monetary system, and proposes, as I have in my scheme, that they should render their dollar an *exact five-franc piece*, notwithstanding that their dollars would not, like our silver coinage, be mere tokens representing in exchange only a given portion of our legal tender, the pound sterling. "*Heureusement*," he observes, "*on a en France une pièce en argent, la pièce de cinq francs, de la valeur, à peu près, de notre dollar. Prenons la pièce de cinq francs, du poids et de l'alliage actuels,*" &c. And is it at such a time that the advocates of the millesimal division of the pound can hope to induce *this country* to condemn itself to the barbarism of utter and universal isolation by abandoning a scheme of decimalisation *practically perfect* "*both at the top and bottom of the scale*," and at the same time admitting at any future day, if found expedient, any of those unessential points as to which there is any difference of opinion amongst the advocates of the tenpenny system—the introduction of a 250d. gold coin, of the Imperial of 100d., or of the entire and absolute abandonment for the tenpence of the pound sterling as a money of account.

Yours, &c.,

THEODORE W. RATHBONE.

PATENT LAW AMENDMENT ACT, 1852.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[From Gazette October 19th, 1855.]

- Dated 20th June, 1855.*
1411. G. M. de Martinol, Valesolis, Tuscany, and J. F. O. De Lara, Spain—Material for paper.
- Dated 18th August, 1855.*
1876. O. J. Henry, Paris—Bookbinding.
- Dated 30th August, 1855.*
1963. W. Gossage, Widnes—Carbonates of ammonia.
- Dated 1st September, 1855.*
1980. W. Smith, 10, Salisbury-street, Adelphi—Smoke-consuming furnace. (A communication.)
- Dated 11th September, 1855.*
2055. T. Heaton, Blackburn—Pumps.
- Dated 2nd October, 1855.*
2192. A. Sands, Manchester—Securing rails in railway chairs.
2194. L. M. R. Péan, Paris—Inkstand.
2196. R. Threlfall and W. Knowles, Preston—Looms.
2198. J. Bernard, Club-chambers, Regent-street—Boots and shoes.
2200. F. F. Benvenuti, Paris—Typography.
2202. G. L. Stott, St. George's, Gloucester—Carbonate of soda.
- Dated 3rd October, 1855.*
2204. W. Ramses, Manchester—Fire arms.
2206. W. Patterson, Batley, and G. Patterson, Sowerby-bridge—Moistening fabrics for finishing.
2208. J. Dickinson, Old Bailey—Paper.
2210. W. E. Newton, 66, Chancery lane—Separating metals from their ores. (A communication.)
- Dated 4th October, 1855.*
2212. H. Oldham, Leeds—Weaving textile fabrics.
2214. J. Lancaster, Deptford—Waterproof material.
2216. T. H. Ryland, Birmingham—Bracelets, &c.
2218. C. Hardy, Carstairs, N.B.—Communicating between guards and drivers of railway trains.
2220. E. Meldrum and J. Young, Glasgow—Salts of sodium and potassium.
2222. H. Over, Cambridge—Gauge knife.
- Dated 5th October, 1855.*
2224. P. A. Halkett, Windham Club, St. James's—Motive power for cultivation of land.
2226. J. D. Pfeiffer, Paris—Knives.
2228. R. H. Hills, Lewes—Jointed backband for gig or brougham harness.
2230. T. Dickens, Middleton—Silk machinery.
2232. F. C. Le Page, Paris—Compositions as a substitute for wood, leather, bone, metal, &c.
- Dated 6th October, 1855.*
2234. A. Coutinho, Oldham—Motive power.
2236. J. Washington, Batley, near Dewsbury—Chimney-sweeping apparatus.
2238. J. H. Johnson, 47, Lincoln's-inn-fields—Consuming smoke of lamps and gas burners. (A communication.)
2240. H. W. Hart, Birmingham—Cannon for gun boats.
- Dated 8th October, 1855.*
2242. J. Hubbard, Albion-road, Hammersmith—Sole for boots and shoes.
2244. J. H. Johnson, 47, Lincoln's-inn-fields—Transmission and conversion of motive-power. (A communication.)
2246. J. H. Henry, Glasgow—Floating vessels.
- Dated 9th October, 1855.*
2248. R. Willan and D. Mills, Blackburn—Looms. (A communication.)
2250. J. G. Martien, Newark, U.S.—Iron and steel.
2254. J. Murdoch, 7, Staple-inn—Extracting colouring matter from lichens. (A communication.)
2256. E. F. Vion, Paris—Tea or coffeepot.
2258. S. Goldner, Wimpole-street—Cooking and preserving animal and vegetable matters.

INVENTION WITH COMPLETE SPECIFICATION FILED.

2271. Jane Ann Herbert, Guilford—Propeller, denominated the Whinfield or conical propeller. (A communication.)

WEEKLY LIST OF PATENTS SEALED.

Sealed October 19th, 1855.

863. Thomas Lees, Birmingham—Improvements in metallic pens.
864. Edward Howes and Walter Howes, Birmingham—Improvements in carriage lamps.
885. Horatio Allen, Novelty Iron Works, New York—Improvements in the valves of steam and other engines.
898. William Winter, Carlton-hill, Nottingham—Improvements in the manufacture of warp looped fabrics.
902. Alexander Balan, Paris—Improvements in transporting passengers and goods.
904. Joseph Wright, 12, Sussex-terrace, Islington, and Edward Brimble, 32, Cheapside—Improvements in the manufacture of stays or corsets, and in the means or method of fastening the same.
930. Auguste Edouard Loradoux Bellford, 32, Essex-street, Strand—Improvements in the manufacture of seamless garments or other useful articles of felt.
934. Auguste Edouard Loradoux Bellford, 32, Essex-street, Strand—Improved lock for sliding doors.

944. Peter Armand le Comte de Fontaine Moreau, 39, Rue de l'Echiquier, Paris—Improvements in apparatus for preventing the escape of fluids, which he calls diaphragm obturator.
948. Robert Paul Coignet, Rue du Bac, 42, Paris—Improvements for rendering tissues waterproof.
960. Frank James Wilson Packman, M.D., Puckeridge, Herts—Improvements in projectiles, in projectile instruments, and in the means of charging the same.
974. George Wigzell Knocke, Bushy Ruff, Dover—Improvements in motive power by means of water and air.
982. John Scott Lillie, 4, South-street, Finsbury—Improvements in tents or other moveable habitations.
986. Henry Lee, jun., Lambeth, and John Gilbert, Hackney-road—Machinery for mixing the substances used in the formation of concrete and other like substances.
1008. Henry Gustave Adrien Pecoul, 39, Rue de l'Echiquier, Paris—Mode of generating power in steam engines.
1056. Frederick William Norton, Edinburgh—Improvements in the manufacture or production of figured pile fabrics.
1392. John Jones, Sheffield—Improvements in obtaining motive power.
1612. James Kelly, Essex bridge, Dublin—Improvements in bending or shaping iron hoops for casks.
1804. Peter Armand le Comte de Fontaine Moreau, 4, South-street, Finsbury—Improvements in feeding steam boilers.

Sealed October 23rd, 1855.

909. Henry Jeremiah Hiffe and James Newman, Birmingham—Improvements in the manufacture of covered buttons.
913. James Hunter and George Hunter, Leysmill—Improvements in stone cutting machinery.
915. Frederick James Utting, Wisbeach—Improvements in land rollers and clod crushers.
919. Henry Cockcroft, Haslingden, Lancaster—A self-registering letter box.
924. Mark Mason, Dukinfield—Improved machinery or apparatus for manufacturing metallic "sole-tips" and "heels" for clogs, boots, or other coverings for the feet.
925. John Joseph Victory, Henrietta-street—Apparatus for marking out curved lines upon wood and stones, specially adapted to the marking out of hand railings, together with improved machinery for boring and sawing wood.
929. Auguste Edouard Loradoux Bellford, 32, Essex-street, Strand—An improved gas regulator.
931. Auguste Edouard Loradoux Bellford, 32, Essex-street, Strand—Improvements in scales or machines for weighing.
938. Edward Frankland, Owen's College, Manchester—Improvements in the treatment of certain salts, commonly called alums, to obtain products therefrom.
941. John Silvester, Smethwick—Improvements in spring balances, and in their connection and adjustment to steam valves.
952. Emile Muller, Joseph Gilardoni, and Xavier Gilardoni, Paris—A grooving and clamping hooked tile, by means of which the entire covering of a roof is tied together; a machine for the fabrication of such tile, by which it is continuously delivered from the mould, through a peculiar system of delivery, applicable to any matter that may be moulded, and a continuous succession of furnaces for its burning.
1004. Alexander Brandon, Paris—Improvements in heating and warming apparatus.
1012. Daniel Foxwell, Manchester—Improvements in machinery or apparatus for making wire cards, and in the manufacture thereof.
1064. Joseph Pascall, Chislehurst, and George Fry, Lee—Improvements in blanching, forcing, and propagating garden-pots.
1394. Charles Antoine Hartmann, Paris—Improvements in the preparation or combination of colours for printing stuffs and textile fabrics.
1874. William Sangster, 75, Cheapside—Improvement in the manufacture of umbrellas and parasols.

PATENTS ON WHICH THE THIRD YEAR'S STAMP DUTY HAS BEEN PAID.

October 1st.

57. John Joseph Macdonnell, Temple-mead, Bristol—Improvements in the construction of railways.
92. Thomas Lawes, 32, City-road—Improvements in the manufacture of agricultural implements, or an improved agricultural implement.
93. Thomas Lawes, 32, City-road—Improved quilt or coverlid.

October 5th.

237. Herm Jager, Ludgate-hill—Improvements in the treatment of cotton and other similar fabrics by the introduction of chemical agents, to supersede the use of dung in the dunging process.

October 15th.

392. Joseph Burch, Crag-hall, near Macclesfield—Improvements in baths and bathing.
393. Joseph Burch, Crag-hall, near Macclesfield—Improvements in building ships and vessels, for the purpose of saving lives and property in cases of shipwreck or fire at sea.
417. Pierre Augustin Puis, Paris—Improved chain or cable, and an apparatus employed therewith for certain applications.
507. Felix Lieven Bauwens, Croydon—Improvements in treating fatty matters prior to their being manufactured into candles and mortars, which are also applicable to oils.